

REMARKS

Regarding the amendments

Claim 1 has been amended to (1) specify that the polyurethane foam is flexible, (2) specify that the blowing agent includes water and (3) specify the structure of the hydroxymethyl-containing polyester polyol. The structure of the hydroxymethyl-containing polyester polyol in amended claim 1 is that previously specified in claim 7 (now canceled), with the additional limitation that the R group is now defined as a polyether polyol. Support for the “flexible” limitation is found on page 1 line 26 of the specification, and elsewhere throughout the specification. Support for the “water” limitation comes from original claim 6 and at page 11 lines 3 et seq. Support for the structural limitations of the hydroxymethyl-containing polyester polyol is in original claim 1, and from page 3 line 17 through page 4 line 35 of the specification, and page 7 line 1.

New claims 36-38 have been added, to specify more preferred initiator types. Support for these claims is found on page 7 lines 2-4.

The total number of claims in the case is now 30, which is less than the amount previously paid for. Therefore, no excess claims fee is believed to be due on account of this amendment.

Regarding the art rejection

Original claims 1-35 were rejected over the combination of U. S. Patent No. 5,981,613 (Cobb) and U. S. Patent No. 4,423,162 (Peerman).

Cobb is cited as a general reference describing the manufacture of polyurethane slabstock foam, apparently being selected on the basis of its teachings regarding surfactants. Peerman describes certain hydroxymethyl-containing polyester polyols, but Peerman fails to describe any flexible polyurethane foams or any polyurethane foams made using water as a blowing agent.

No combination of Cobb and Peerman leads to the presently claimed invention.

Those familiar with the art of producing flexible polyurethane foams would understand that although a wide variety of polyols might be expected to react with polyisocyanates in the presence of water to produce foams, the mere ability to react is not sufficient to produce foams on a commercial basis. The foams have to have good properties,

which means in part that the water must be able to disperse well into the polyol and other ingredients, and that the sequencing of the blowing and gelling reactions must be right. Note that, despite Peerman's broad, somewhat speculative teachings, Peerman was only able to demonstrate that he could make non-cellular polyurethanes, using polyester polyols in which the average number of A groups per molecule does not exceed 1 times n, and in which the initiator compounds (corresponding to the "R" group in the claims) are certain low molecular weight compounds different from polyether polyols. There is little reason that one of ordinary skill in the art would expect anything more than that the Peerman polyols would simply react if put into a polyurethane foam formulation. One has no basis to expect that the polyols would produce good quality polyurethane foams if made with the proper A/n ratio and the proper initiator. What applicants have found is that the polyester polyols identified in their claims give very good results, even when used as the only high equivalent weight polyol in a foam formulation. This is very surprising, given the highly hydrophobic nature of the fatty acids upon which the polyester polyols are based.

The "motivation" that the examiner alleges, i.e., "for the purpose of achieving adequate product formation with less required heating on mixing" is not a real one. Polyether polyols as described in Cobb are already reasonably low viscosity materials, and it is typical to employ no heating at all on mixing in slabstock foam processes. The source of this alleged "motivation" appears to come from column 1 lines 17-26 of Peerman, where certain caprolactone polyols are described as "solids and thus are of limited utility because they must be heated above their melting point in order to be capable of reacting efficiently with other materials". But the polyols referred to there are not normally used to produce flexible polyurethane foams, and are not the type of polyols described by Cobb. Polyurethane foam processes are based the use of liquid precursor materials that can be pumped to a mixhead where they can mix and react with each. The replacement of solid polyols is not a problem in the flexible polyurethane foam art; therefore, there would be no motivation to use Peerman's polyols in a flexible foam process.

Applicants therefore believe that the claims as amended define subject matter that is novel and unobvious over the cited art. A notice of allowance is respectfully requested.

Respectfully submitted,
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